Comments on: "Forward scattering of a Gaussian beam by a nonabsorbing sphere."[1]

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In this paper the authors correctly indicate that some years ago Mr. Tsai and I presented a formulation of this problem which removed the size restriction on the diameter of the spherical particle imposed in earlier treatments. However, I wish to point out that the primary purpose of our paper was to establish an exact formulation of the problem along the lines outlined by the present authors. That is, the desired beam which is an approximate solution of Maxwell's equations is itself approximated by a sum (in our case an integral) of exact solutions thereof. The result, as pointed out by Hodges, et.al. [1] and by Gouesbet, et.al. in a companion paper [2], is a field which is an exact solution of Maxwell's equations and which closely resembles the desired beam-like field distribution. While arrived at in a somewhat different manner, that is the concept we presented in our earlier paper. [3] This is not meant to detract in any way from the contribution of the present authors. Rather, I am gratified that this idea has, after all these years, found its way into valuable application and, I might add, elegantly couched in the context of Davis beams.

Finally, I wish to point out that, through an unfortunate debacle concerning the reference numbering, a reference in my earlier paper with Mr. Tsai which was intended to indicate where one might find the expansion of vector cylindrical waves in terms of vector spherical waves (partial waves.), appeared instead as a reference to the classic text by J. A. Stratton. While the error was later pointed out in an "Erratum" [4] , the correct reference was not included. That omission is rectified here. [5] In that paper an expansion in terms 'of partial waves; i.e., exact solutions of Maxwell's equations, is used to represent a beam-like field. However, the beam is of dubious practical interest in that it has a null on axis. Nevertheless, the partial wave expansion needed for the later work [3] is published therein.

References.

1. J. T. Hodges, G. Grehan, G. Gouesbet, and C. Presser, "Forward scattering of a Gaussian beam by a nonabsorbing sphere," Appl . Opt., 34, 12, 2120-2132, 20 April 1995.

2. G. Gouesbet, J. A. Lock , and G. Grehan, "Partial -wave representation of laser beams for use in linght-scattering calculations, " Appl . opt., 34, 12, 2133-2143, 20 April 1995.

3. W.-C. Tsai and R. J. Pogorzelski, "Eigenfunction solution of the scattering of beam radiation fields by spherical objects," JOSA, 65, 12, 1457-1463, Dec. 1975.

4. JOSA, 66, 4, 401, April. 1976.

5. R. J. Pogorzelski and E. Lun, "On the expansion of cylindrical vector waves in terms of spherical vector waves," Radio Science, 11, 10, 753-761., Oct. 1976.